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EXAMINER

CHANG, AUDREY Y

ART UNIT

PAPER NUMBER

2872

DATE MAILED: 04/30/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/668,297

Applicant(s)

MASHITANI ET AL.

Examiner

Audrey Y. Chang

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 February 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 and 8-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 and 8-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on *February 19, 2003* has been entered.
2. This Office Action is also in response to applicant's preliminary amendment filed on February 19, 2003, which has been entered as paper number 14.
3. By this amendment, the applicant has amended claims 1, 3, 8, 9, 12 and 13.
4. The rejections to claims 1-6, and 8-13 under 35 USC 112, first and second paragraph, set forth in the previous Office Action are withdrawn.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claim 13 is rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to *enable* one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The specification fails to teach how could a "continuous shading part" be capable of being made to "disappear" by structuring liquid crystal shutters as stated in claim 13.

Claim Objections

7. Claims 1-6 and 7-13 are objected to because of the following informalities:

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(1), claims 1 and 8 recite a control means for dividing the shading means into “areas” yet the claims fail to give the structural and logical relationship between the divided areas and the shading means. It is not clear if each of the area include a shading means with a continuous shading part with liquid crystal shutters provided at both side of the shading part or not. This lacking of structural and logical relationship makes the phrase concerning “aperture” and “aperture ratio” of claim 8 vague, particularly confusing and indefinite. Appropriate correction is required.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

9. **Claims 1-6, and 8-13 are rejected under 35 U.S.C. 102(e) as being anticipated by the patent issued to Hamagishi (PN. 6,049,424).**

The applied reference has a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention “by another,” or by an appropriate showing under 37 CFR 1.131.

Hamagishi teaches a three dimensional display device of autostereoscopic type that is comprised of:

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(1) a *liquid crystal display panel* (20) serves as the image display means for displaying alternatively arranged left eye image strips and right eye image strips, (please see Figure 1),

(2) a *sensor* (101) for sensing the position of a viewer, including his head position, that is viewing the display, (please see Figure 25, column 10, lines 18-20),

(3) a *shading barrier* (10) having *barrier* (12) serves as the *continuous shading part* wherein a shading movement means is provided to shift the positions of the barrier (12), and the shading movement means is comprised of the barrier (12) and a *pair of liquid crystal shutters* (31 and 32) located at each side of the barrier (12), (please see Figure 5) such that the liquid crystal shutters may be controlled and switched between ON and OFF states to provide *shifting of the shading parts* such that the shading barrier or the barrier (12) is moved in accordance to the movement of the observer, (please see the Abstract and Figures 5-6),

(4) a *position sensing control means*, serves as the sensor for detecting a head position of a viewer, and

(5) a *shading movement means* including a shading barrier control circuit in response to the detected movement of the head that controls the shifting of the barrier (12) in the shading barrier (10) and divides and determines the areas of the barrier (12), (please see Figure 5).

Hamagishi teaches that the barrier movement means moves the barrier of the shading barrier by a quarter of the pitch of the barrier, (please see column 23, lines 25-27).

It is implicitly true that the liquid crystal display means is controlled to have the left eye image and right eye image displayed areas in accordance with the barrier arrangement and movement of the shading barrier in order to provide stereoscopic image display. The left eye and right eye images are displayed alternatively in striped shape on a liquid crystal panel (20), (please see Figures 5 and 22).

With regard to claim 4, Hamagishi teaches that the shading barrier is placed between the light source (30) and the LCD panel, (please see Figure 1).

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With regard to claim 5, Hamagishi also teaches that the shading barrier may be placed at the light emission side of the LCD panel, (please see Figure 10).

With regard to claim 6, Hamagishi teaches that the shading barrier may comprise a liquid crystal panel, (please see Figure 10, column 11).

With regard to claims 7-9, Hamagishi teaches that the shading barrier (10) may comprise a shading barrier (12) and a pair of liquid crystal switches (31 and 32) that are turned on or off in response to the detected the movement of the head of the observer, (please see Figure 10 and column 11). An aperture is defined by the slit and ON state of the liquid crystal shutter, (please see Figure 5), and the aperture ratio is equivalent to the boundary edge of the divided areas for effective slit and effective barrier and the aperture ratio is uniform through out the shading barrier. With regard to claim 9, the liquid crystal shutters are also sandwiching the slit, (please see Figure 5).

With regard to claim 13, Hamagishi teaches that the shading barrier is composed of LCD panel such that the barrier may be switched between on and off states and the liquid crystal display means may be switched between the states of displaying 3D images and 2D images, (please see column 3, lines 30-35).

This reference has therefore anticipated the claims.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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11. Claims 1, 3, 5, 6, 8-9 and 11-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Isono et al in view of the patent issued to Chikazawa.

Isono et al teaches a three dimensional image display of the *autostereoscopic* type, wherein the display comprises:

(1) a *liquid crystal panel* (46), serves as the *image display means*, for displaying alternative image strips of left eye image and right eye image, (please see Figure 2),

(2) a *parallax barrier panel* (28), serves as the *shading means*, for displaying and shifting the positions of stripe barrier that is displayed on the panel,

(3) a *head position detecting unit* (8), serves as the *sensor for detecting a head position* of a viewer, and

(4) a *computer* (20) and a *controller* (22), serve as the *area shifting and division control means* for dividing the parallax barrier panel into areas of the stripe barrier and shifting them to appropriate places for providing stereoscopic image display, (please see Figures 1-2, columns 4-7).

This reference has met all the limitations of the claims. Isono et al teaches that the parallax barrier is composed of a liquid crystal panel but it does not teach explicitly that it may also be comprised of liquid crystal shutters at two sides of a continuous shading part. Chikazawa in the same field of endeavor teaches a parallax barrier device that is composed of a liquid crystal device (38) having *strips* of liquid crystal shutters (39 and 40, Figure 13) wherein each of the shutters may be switched between ON and OFF state to provide movable barrier, (please see column 6). It would then have been obvious to one skilled in the art to apply the teachings of Chikazawa to modify the parallax barrier of Isono et al to be composed of liquid crystal shutters for providing an alternative arrangement for the barrier particularly to allow the shifting and movement of the barrier. Although these references do not teach explicitly to have a continuous shading part of barrier, such modification is considered to be an obvious to one skilled in the art since one can easily make one part of the panel or one set of the shutters to always be at a non-

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transparent or OFF state. In fact, by keeping one of the liquid crystal shutters at OFF state always, and by switching the liquid crystal shutters at both sides of the OFF stated shutter one can achieved the various barrier arrangements taught by Isono et al in Figures 6A to 6F for the benefits of providing different barrier arrangements for different viewing requirements.

With regard to claim 3, it is implicitly true that the liquid crystal panel for displaying the strip images is divided into strip areas that are in accordance to the positions of the stripe barrier on the parallax barrier panel in order to produce stereoscopic display of the images.

With regard to claim 5, Isono et al teaches that the parallax barrier panel (28) is placed at the light emission side of the liquid crystal image display panel (46), (please see Figure 1).

With regard to claim 6, Isono et al teaches that the parallax barrier panel is a liquid crystal panel, (please see column 4).

With regard to claim 8, Isono et al teaches the shading means may have various arrangements of aperture for properly observing the image displayed.

With regard to claim 11, Isono et al teaches the barrier panel is divided into uniform areas.

With regard to claim 13, Isono et al teaches that parallax barrier panel may be controlled so that the image display apparatus may be used to display two-dimensional image.

12. Claims 2, 4, and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patents issued to Isono et al in view of Chikazawa as applied to claim 1 above, and further in view of the patent issued to Taniguchi et al.

The three-dimensional image display taught by Isono et al in combination with the teachings of Chikazawa as described for claim 1 above has met all the limitations of the claims. Isono et al teaches that the stripe barrier on the parallax barrier panel is shifted by one pixel in response to the movement of the observer via the movement command from the controller (22) to provide stereoscopic image display but it does not teach explicitly that the one pixel is one quarter of the pitch of the parallax barrier, (please

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see column 7). Taniguchi et al in the same field of endeavor teaches a stereoscopic image display wherein the parallax barrier is driven to be shifted by one pixel, which corresponds to one third of the pitch of the stripe barrier, for adjusting the viewing condition of the display, (please see Figure 11B). Although these references do not teach that the one pixel is one quarter of the pitch of the parallax barrier however such modification would have been obvious to one skilled in the art since both of the references teach to shift the barrier in pixel length, which could be a fraction of the pitch of the parallax barrier, in order to obtain optimum viewing condition. Since it has been held when the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges (i.e. quarter length of pitch) involves only routine skill in the art. In re Aller, 105 USPQ 233.

With regard to claim 4, Isono et al does not teach explicitly to have the parallax barrier arranged between a light source and the image display panel. Taniguchi et al in the same field of endeavor teaches the stereoscopic image display may either have the parallax barrier placed at the emission side of the image display panel, (please see Figures 1 and 9) or have the parallax barrier placed between a flat backlight source (21) and the display panel (1), (please see Figure 29). It would then have been obvious to one skilled in the art to apply the teachings of Taniguchi et al to modify the three dimensional image display of Isono et al to have the parallax barrier placed between the light source and the image display panel for the benefit of providing an alternative arrangement for the display.

With regard to claim 10, both Isono et al and Taniguchi et al teach that the parallax barrier may be formed with different patterns of barrier areas for the purpose of improving the display and viewing quality. It would then have been obvious to one skilled in the art to design the parallax barrier to have different patterns for the barrier areas for the benefit of improving the image display quality.

Response to Arguments

13. Applicant's arguments filed on February 19, 2003 have been fully considered but they are not persuasive. The amended claims have been fully considered and they are rejected for reasons stated above.

14. The applicant is respectfully reminded that claim 13 *has not been amended* as claimed by the applicant in the Remark to claim the "shiftable shading part" and the phrase "the shiftable shading part" does not have a proper antecedent basis from its based claim.

15. In response to applicant's argument, which states that the cited Hamagishi reference *does not* teach,

(1) a continuous shading part with liquid crystal shutters provided on both sides of the continuous shading part for tuning on or off based upon the position of the head of the viewer to generate a binocular parallax,

(2) an area shifting and division control means for dividing the shading means into areas in a horizontal direction and controlling shifting of liquid crystal shutters in each of the areas, and

(3) the aperture ratio recited in claim 8,

the examiner respectfully *disagrees* for the reasons stated below.

Firstly, the applicant is respectfully reminded that the cited Hamagishi reference teaches the shading barrier comprised a *barrier* (12, Figure 5) that serves as *the continuous shading part* with liquid crystal shutters (31 and 32) on both sides of the barrier. The position of the barrier is shifted or moved by controlling the tuning ON or OFF of the liquid crystal shutters, and such control is in accordance with the detection of the head position of the observer. This mechanism is the same as the mechanism disclosed in the instant application. The applicant is respectfully advised that the liquid crystal shutters are placed at both sides of the slit (11, Figure 5) but they are also placed at both sides of the barrier (12, Figure 5). The disclosure of Hamagishi reference specifically teaches that "the BARRIER of the shading barrier is

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laterally moved by the *barrier* movement means, (i.e. the control switching of the liquid crystal shutters) to allow normal 3D image viewing, (please see column 2, lines 50-67, to column 3, lines 1-12).

Hamagishi also specifically teaches the shifting of positions or movement of the BARRIER of the shading barrier is in accordance with the movement of the head of the viewer to accommodate normal 3D image viewing.

Secondly, Hamagishi teaches that the shading barrier is composed of a LCD panel wherein the barrier and slit of the shading barrier are being switched to its ON and OFF states, furthermore Hamagishi teaches to include a shading barrier control circuit unit (115, Figure 10), wherein the switching of liquid crystal shutters is controlled by the circuit unit which *effectively divides* the shading barrier into barrier and slit areas along the horizontal direction.

Thirdly, the aperture ratio defined by the ON state of the shutter and the slit is equivalent to the boundary edge of the dividing areas of the effective barrier and effective slit for creating normal 3D viewing also the aperture ratio is uniform through out the shading barrier, (please see Figure 5).

This reference therefore has therefore anticipated the claims.

In response to applicant's argument which states that the cited Isono et al reference does not disclose a continuous shading part the examiner respectfully disagrees. The applicant is respectfully directed to Figures 6A to 6F of Isono et al wherein a continuous

Terminal Disclaimer

The terminal disclaimer filed on April 24, 2002 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of US patent 6,049,424 has been reviewed and is accepted. The terminal disclaimer has been recorded.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Audrey Y. Chang whose telephone number is 703-305-6208. The examiner can normally be reached on Monday-Friday (8:00-4:30), alternative Mondays off.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cassandra Spyrou can be reached on 703-308-1637. The fax phone numbers for the organization, where this application or proceeding is assigned are 703-872-9318 for regular communications and 703-872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

Audrey Y. Chang
Primary Examiner
Art Unit 2872

A. Chang, Ph.D.
April 28, 2003